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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/626,881	07/25/2003	Il-kwon Moon	277/014	1045
27849	7590	04/19/2005	EXAMINER	
LEE, STERBA & MORSE, P.C. 1101 WILSON BOULEVARD SUITE 2000 ARLINGTON, VA 22209			THOMPSON, TIMOTHY J	
			ART UNIT	PAPER NUMBER
			2873	

DATE MAILED: 04/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/626,881

Applicant(s)

MOON ET AL.

Examiner

Timothy J. Thompson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 5-11 is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>07/2003</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3 are rejected under 35 U.S.C. 102(b) as being anticipated by Koops et al.(U.S. Pat. No. 5,973,823).

Regarding claim 1, Koops et al. discloses a photonic crystal including a material that is capable of varying its refractive index in accordance with an electric field(col 4, lines 19-28), the photonic crystal having a photonic bandgap in a specific frequency range(col 3); and an upper transparent electrode and a lower transparent electrode arranged on an upper side and a lower side of the photonic crystal(fig 1, 8), respectively, to which a voltage is applied, wherein a size of the photonic bandgap of the photonic crystal is controlled by the voltage applied between the upper transparent electrode and the lower transparent electrode(col 3, lines 20-48).

Regarding claim 2, Koops et al. discloses a reflection amount of visible light reflected in a specific frequency range from the photonic crystal is variable based on an electric field applied to the photonic crystal(col 3, lines 20-48).

Regarding claim 3, Koops et al. discloses a penetration amount of visible light penetrated in a specific frequency range from the photonic crystal is variable based on an electric field applied to the photonic crystal(col 3, lines 10-21).

Claims 1-4 are rejected under 35 U.S.C. 102(b) as being anticipated by Albu et al.(U.S. Pat. Pub. No. 2004/0001246).

Regarding claim 1, Albu et al. discloses a photonic crystal including a material that is capable of varying its refractive index in accordance with an electric field(fig 1), the photonic crystal having a photonic bandgap in a specific frequency range(para 0020-0025); and an upper transparent electrode and a lower transparent electrode arranged on an upper side and a lower side of the photonic crystal(fig 1, 30, 51a-59a), respectively, to which a voltage is applied, wherein a size of the photonic bandgap of the photonic crystal is controlled by the voltage applied between the upper transparent electrode and the lower transparent electrode(table 1).

Regarding claim 2, Albu et al. discloses a reflection amount of visible light reflected in a specific frequency range from the photonic crystal is variable based on an electric field applied to the photonic crystal(para 0021).

Regarding claim 3, Albu et al. discloses a penetration amount of visible light penetrated in a specific frequency range from the photonic crystal is variable based on an electric field applied to the photonic crystal(para 0021).

Regarding claim 4, Albu et al. discloses an upper transparent substrate(fig 1, 40) and a lower transparent substrate(fig 1, 41) having the upper and lower transparent

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electrodes(fig 1, 30, 51a-59a), respectively, coated thereon, the upper transparent substrate and the lower transparent substrate being capable of applying an electric field to the photonic crystal(table 1), wherein the upper transparent substrate and the lower transparent substrate are attached on the upper side and the lower side of the photonic crystal, respectively(fig 1).

Allowable Subject Matter

Claim 5-11 are allowed.

The following is an examiner's statement of reasons for allowance: The prior art taken either singularity or in combination fails to anticipate or fairly suggest the limitations of the independent claim, in such a manner that a rejection under 35 U.S.C. 102 or 103 would be proper. The prior art fails to teach a combination of all the claimed features as presented in independent claims 5 with the allowable feature being includes a plurality of photonic crystals including a material that is capable of varying its refractive index in accordance with an electric field, each of the plurality of photonic crystals having a photonic bandgap in a different frequency range. Therefore claim 5-11 are allowed.

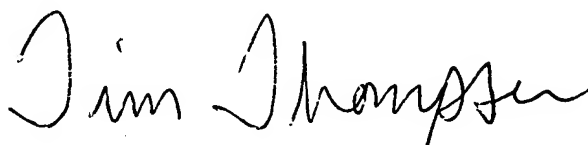
Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy J. Thompson whose telephone number is (571) 272-2342. If the examiner can not be reached his supervisor, Georgia Epps, can be reached on (571) 272-2328.

T.J.T.

4/15/05

A handwritten signature in black ink that reads "Tim Thompson". The signature is written in a cursive, flowing style.

**TIMOTHY THOMPSON
PRIMARY EXAMINER**